



## The Third BenchCouncil International Symposium on Intelligent Computers, Algorithms, and Applications (IC 2023) Call for Papers

### ARTICLE INFO

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### ABSTRACT

Sponsored and organized by the International Open Benchmark Council (BenchCouncil), the IC conference is to provide a pioneering technology map through searching and advancing state-of-the-art and state-of-the-practice in processors, systems, algorithms, and applications for machine learning, deep learning, spiking neural network and other AI techniques across multidisciplinary and interdisciplinary areas. IC 2023 invites manuscripts describing original work in the above areas and topics. All accepted papers will be presented at the IC 2023 conference and published by Springer CCIS (Indexed by EI). The IC conferences have been successfully held for two series from 2019 to 2022 and attracted plenty of paper submissions and participants. IC 2023 will be held on December 4-6, 2023 in Sanya and invites manuscripts describing original work in processors, systems, algorithms, and applications for AI techniques across multidisciplinary and interdisciplinary areas. The conference website is <https://www.benchcouncil.org/ic2023/>.

#### Important Dates:

Paper Submission: July 31, 2023, at 11:59 PM AoE  
Notification: September 30, 2023, at 11:59 PM AoE  
Final Papers Due: October 31, 2023, at 11:59 PM AoE  
Conference Date: December 4-6, 2023  
Submission Site: <https://ic2023.hotcrp.com/>

### 1. Introduction

The mission of IC 2023 is to provide a pioneering technology map through searching and advancing state-of-the-art and state-of-the-practice in processors, systems, algorithms, and applications for machine learning, deep learning, spiking neural network and other AI techniques across multidisciplinary and interdisciplinary areas. The BenchCouncil staff will invite worldwide contributors to showcase their superior chips, systems, algorithms and applications. IC 2023 also solicits manuscripts describing original work in the above areas.

IC 2023 invites manuscripts describing original work in the above areas and topics. All accepted papers will be presented at the IC 2023 conference and published by **Springer CCIS (Indexed by EI)**. With generous support from BenchCouncil, IC 2023 will offer travel grants for students to defray a portion of their travel costs. The size and number of these grants will vary depending on funding availability, the number of student applicants, and their respective priority. Grant awards will be made before the early registration deadline; expenses will be reimbursed after the conference; grant recipients will be asked to submit original receipts to verify their expenditures as well as a 1-page summary of their involvement during the conference. While we encourage all in need of a travel grant to apply, the selection process will give higher priority to students who would otherwise not be able to attend the conference. We strongly encourage applications from students that belong to under-represented groups.

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### 2. Call for papers

The IC conference encompasses a wide range of topics in intelligent computers, algorithms, and applications in computer science, civil aviation, medicine, finance, education, etc. IC's multidisciplinary and interdisciplinary emphasis provides an ideal environment for developers and researchers from different areas and communities to discuss practical and theoretical work. The topics of interest include, but are not limited to the following:

#### AI Algorithms

machine learning (deep learning, statistical learning, etc.)  
natural language processing  
computer vision  
data mining  
multiagent systems  
knowledge representation  
robotics

search, planning, and reasoning

#### AI Systems

Scalable and distributed AI systems  
High-performance computing for AI  
System-level optimization for deep learning  
Efficient hardware architectures for AI

Model compression and acceleration techniques  
 Memory management and resource allocation in AI systems  
 Real-time and edge AI systems  
 AutoML and automated system design  
 Benchmarking and evaluation of AI systems  
 Observability of AI systems  
 Edge computing for AI systems  
 Reliability of AI systems  
 GPU sharing  
 Intelligent Operations of AI systems  
 Graph computing systems  
 Domain-specific AI systems  
 Serverless architecture for AI systems

#### **AI for Ocean Science and Engineering**

Ocean Front Detection  
 Mesoscale Eddy Recognition  
 Underwater Image Enhancement  
 Underwater Image Super-Resolution  
 Underwater Object Recognition, Detection and Tracking  
 Sea Surface Height Estimation  
 Sea Surface Temperature Estimation  
 Internal Wave Identification  
 Wave Height Estimation

#### **AI in Finance**

Applications of AI in finance: such as capital markets, investment and financing in real economy, risk management, investment decision-making, transaction execution, etc.

Impact of AI on the financial industry: discuss the influence of AI in the financial industry, such as improving efficiency, reducing risks, and optimizing customer experience.

Challenges and opportunities for AI: Explore the technical, ethical, regulatory, and other challenges faced by AI in the financial field, and how to overcome them.

Sustainable development of intelligent finance: explore how to promote the development of finance industry with extensive AI application while maintaining the principles of sustainable development.

Ethics and transparency: explore the ethical and transparency issues raised by AI in the financial field.

#### **AI for Education**

Position papers on AI for education  
 Large language models for education  
 AI models of teaching and learning  
 AI-assisted education  
 Innovative applications of AI technologies in education  
 Evaluation of AI technologies in education  
 Intelligent tutoring systems  
 Human-computer collaborative education systems  
 Ethics and AI in education  
 Impacts of AI technologies on education

#### **AI for Law**

Argument mining on legal texts  
 Automatic classification and summarization of legal text  
 Computational methods for negotiation and contract formation  
 Computer-assisted dispute resolution  
 Computable representations of legal rules and domain-specific languages for the law  
 Decision support systems in the legal domain  
 Deep learning on data and text from the legal domain  
 E-discovery, e-disclosure, e-government, e-democracy and e-justice  
 Ethical, legal, fairness, accountability, and transparency subjects arising from the use of AI systems in legal practice, access to justice, compliance, and public administration  
 Explainable AI for legal practice, data, and text analytics  
 Formal and computational models of legal reasoning (e.g., argumentation, case-based reasoning), including deontic logics

Formal and computational models of evidential reasoning  
 Formal models of norms and norm-governed systems  
 Information extraction from legal databases and texts  
 Information retrieval, question answering, and literature recommendation in the legal domain  
 Intelligent support systems for forensics  
 Interdisciplinary applications of legal informatics methods and systems  
 Knowledge representation, knowledge engineering, and ontologies in the legal domain  
 Legal design involving AI techniques  
 Machine learning and data analytics applied to the legal domain  
 Normative reasoning by autonomous agents  
 Open and linked data in the legal domain  
 Smart contracts and application of blockchain in the legal domain  
 Visualization techniques for legal information and data

#### **AI for Materials Science and Engineering**

AI for materials chemistry  
 AI for materials physics  
 AI for materials characterization  
 AI for materials design  
 AI for materials manufacturing and processing  
 AI for materials in industry

#### **AI for Sciences**

Applications of machine learning in scientific research: Explore the application of machine learning algorithms in scientific data analysis, pattern recognition, classification, and prediction. This includes innovative research in emerging fields such as quantum computing, materials science, climate change, drug discovery, genomics, physics simulation, environmental protection, sustainable energy, and healthcare. For example, using AI techniques to construct complex models and simulate the behavior of natural systems, exploring scientific questions related to climate simulation, cosmological simulation, molecular dynamics simulation, and more.

Assisting experiment design and optimization: Utilize AI to optimize experiment design and parameter optimization, improving experiment efficiency. For example, rapidly determining optimal experimental conditions and reducing the time and cost of experiments.

Natural language processing and scientific literature mining: Explore the application of natural language processing techniques in scientific literature analysis, knowledge graph construction, text summarization, and information extraction, accelerating the dissemination and discovery of scientific knowledge.

Data visualization and scientific communication: Discuss the latest methods and tools for visualizing scientific data and presenting scientific results using AI technology, promoting the communication and sharing of scientific research findings. AI plays a critical role in scientific data analysis. Machine learning and statistical methods can extract useful information and patterns from large-scale scientific datasets, assisting scientists in data mining, feature extraction, data dimensionality reduction, and other tasks.

#### **AI for Civil Aviation**

AI in Aircraft Maintenance, Repair and Overhaul (MRO)  
 AI in Operations Management and Revenue Optimization against safety control  
 AI in Customer Service and Engagement  
 AI in Aircraft Design Optimization  
 AI in Identification of Passengers  
 Pitfalls of using AI in Aviation  
 The integrity, Metadata integration architecture, effectiveness, consistency, standardization, openness and sharing management of the civil aviation data

Digital Business of civil aviation, quality management of Civil Aviation data

Digital Air-Control Management and Digital Surveillance Management of Civil Aviation

#### **AI for Medicine**

Medical AI and Interpretable Medical Models

AI, Block Chain, Cloud, and Data Techniques for Medicine

Big Medical data and Privacy Protection

Artificial Intelligence and Medical Image Analysis

Internet-based Medical Diagnosis

Medical Robot

Drug discovery and Computer-aided Design

Artificial Intelligence in Medical Diagnosis

Medical Data and AI Practice and Case Study

#### **AI for Space Science and Engineering**

Space science target prediction, detection and feature extraction based on AI technology

Uncertain analysis of AI models in space science

Physics-informed machine learning in space science

AI surrogate of the physics models

How to gain new knowledge from the space science AI models

Foundation models in space science

Use AI technology to assist in space mission planning and scheduling

AI-assisted space satellite anomaly detection and emergency decision-making

#### **AI for High Energy Physics**

Machine learning methods or models for HEP, including event triggering, particle identification, fast simulation, event reconstruction, noise filtering, detector monitoring, and experimental control.

Utilizing high-performance computing for implementing machine learning methods in HEP, such as feature detection, feature engineering, usability, interpretability, robustness, and uncertainty quantification.

Optimizing machine learning models on large-scale HEP simulation or experimental datasets.

Deepening the modeling and simulation of HEP scientific problems using machine learning techniques.

Harnessing emerging hardware (e.g., GPUs, NPUs, FPGAs) to accelerate machine learning processes for HEP data.

Applications of large-scale language models in machine learning for HEP.

Applications of quantum machine learning in machine learning for HEP.

#### **AI and Security**

Security and Privacy of AI

Fairness, interpretability, and explainability for AI

AI Regulations

Adversarial learning

Membership inference attacks

Data poisoning & backdoor attacks

Security of deep learning systems

Robust statistics

Differential privacy & privacy-preserving data mining

AI for security and privacy

Computer forensics

Spam detection

Phishing detection and prevention

Botnet detection

Intrusion detection and response

Malware identification and analysis

Intelligent vulnerability fuzzing

Automatic security policy management & evaluation

Big data analytics for security

### **3. Paper submission**

Papers must be submitted in PDF. For a full paper, the page limit is 15 pages in the CCIS format, not including references. For a short paper, the page limit is 8 pages in the CCIS format, not including references. Authors are also encouraged to submit a 4-page extended abstract and make an extension after acceptance.

The review process follows a strict double-blind policy. The submissions will be judged based on the merit of the ideas rather than the length. After the conference, the proceeding will be published by **Springer CCIS (Indexed by EI)**. Please note that the CCIS format (**LaTeXTemplate**) is the final one for publishing.

At least one author must pre-register for the conference, and at least one author must attend the conference to present the paper. Papers for which no author is pre-registered will be removed from the proceedings.

Please make sure your submission satisfies ALL of the following requirements:

- \* All authors and affiliation information must be anonymized.
- \* Paper must be submitted in printable PDF format.
- \* Please number the pages of your submission.
- \* The submission must be formatted for black-and-white printers. Please make sure your figures are readable when printed in black and white.
- \* The submission must describe unpublished work that is not currently under review at any other conference or journal venues.

**LaTeX Template:** <https://www.benchcouncil.org/file/lnlcs2e.zip>

### **4. Past IC conferences and proceedings**

The IC conference has been successfully held for two series, from 2019 to 2022. Their websites and proceedings are as follows.

- \* **IC 2020** Website: [https://www.benchcouncil.org/conferences/ficc/2020/ic20/ic20\\_en.html](https://www.benchcouncil.org/conferences/ficc/2020/ic20/ic20_en.html)  
Proceeding [1]: <https://link.springer.com/book/10.1007/978-981-16-1160-5>
- \* **IC 2019** Website: [https://www.benchcouncil.org/conferences/ficc/2019/ic19/ic19\\_en.html](https://www.benchcouncil.org/conferences/ficc/2019/ic19/ic19_en.html)

### **5. Review rules**

To reflect fairness, we will treat each article under the same rules. This set of review ethics is derived and based on the MICRO 2020 [2], ASPLOS 2020-2021 [3,4], ISCA 2020-2021 [5,6] review guidelines, and the details are as follows:

- (1) The online discussion is blind. While the reviewers discuss the papers, they don't know others' identities beyond reviewer #A, #B. Hence, a single reviewer cannot easily assert seniority and silence other voices or influence them beyond the strength of their arguments.
- (2) When the reviewers point out closeness to prior work that informs the reviewer's decision to lower the novelty and contribution of a paper, they should provide a full citation to that prior work.
- (3) When the reviewers asking authors to draw a comparison with concurrent work (e.g., work that was published or appeared online \*after\* the paper submission deadline) or with preliminary work (e.g., a poster or abstract that is not archival), this comparison should not inform a lower score by the reviewer.
- (4) Provide useful and constructive feedback to the authors. Be respectful, professional, and positive in your reviews and provide suggestions for the authors to improve their work.

- (5) Score the paper absolutely and relative to the group of papers you are reviewing.  
Absolute overall merit - There are four grades you can give to each paper for absolute overall merit; the top 2 ratings mean that you think the paper is acceptable to the conference and the bottom 2 ratings mean that in your opinion the paper is below the threshold for the conference. Please assign these values thinking, whether the paper is above the threshold for the conference or below.  
Relative overall merit – is based on the papers that you are reviewing. You can rank your papers and then group the papers into the four bins. Except for fractional errors, you should be dividing your papers equally into the four categories.
- (6) Reviewers must treat all submissions as strictly confidential and destroy all papers once the technical program has been finalized.
- (7) Reviewers must contact the PC chair or EIC if they feel there is an ethical violation of any sort (e.g., authors seeking support for a paper, authors seeking to identify who the reviewers are).
- (8) Do not actively look for author identities. Reviewers should judge a paper solely on its merits.
- (9) If you know the authors, do not publicize the authors. If you would like to recuse yourself from the review task, contact the PC Chair.
- (10) Reviewers should review the current submission. If you have reviewed a previous submission, make sure your review is based on the current submission.
- (11) Reviewers must not share the papers with students/colleagues.
- (12) Reviewers must compose the reviews themselves and provide unbiased reviews.
- (13) Do not solicit external reviews without consulting the PC chairs or EIC. If you regularly involve your students in the review process as part of their Ph.D. training, contact the PC chairs. You are still responsible for the reviews. You may do this on no more than one of your reviews.
- (14) Reviewers must keep review discussions (including which papers you reviewed) confidential.
- (15) Do not discuss the content of a submitted paper/reviews with anyone other than officially on the submission management system like HotCRP or EasyChair during the online discussion period or the PC meeting (from now until paper publication in any venue).
- (16) Do not reveal the name of paper authors in case reviewers happen to be aware of author identity. (Author names of accepted papers will be revealed after the PC meeting; author names of rejected papers will never be revealed.)
- (17) Do not disclose the outcome of a paper until its authors are notified of its acceptance or rejection.
- (18) Do not download or acquire material from the review site that you do not need access to.
- (19) Do not disclose the content of reviews, including the reviewers' identities or discussions about a paper.

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